

### **AMENDMENTS TO THE CLAIMS**

Please amend the claims as follows:

This listing of claims will replace all prior versions, and listing, of claims in the application.

#### **Listing of Claims:**

Claim 1 (Currently amended): An isolated, synthetic, or recombinant nucleic acid comprising

- (a) a nucleic acid sequence having at least ~~[[90]]~~95% sequence identity to SEQ ID NO:23, over a region of at least 1650 residues, wherein the nucleic acid encodes a polypeptide having a laccase activity, or
- (b) a nucleic acid sequence completely complementary to (a).

Claim 2 (Currently amended): ~~The~~ An isolated, synthetic, or recombinant nucleic acid ~~of claim 1, wherein the sequence identity is at least~~ comprising a nucleic acid sequence having at least ~~[[95%]]~~ 97% sequence identity to SEQ ID NO.:23, over a region of at least 1650 residues, wherein the nucleic acid encodes a polypeptide having a laccase activity.

Claim 3 (currently amended): ~~The~~ An isolated, synthetic, or recombinant nucleic acid ~~of claim 1, wherein the sequence identity is at least~~ comprising a nucleic acid sequence having at least 99% sequence identity to SEQ ID No.:23, over a region of at least 1650 residues, wherein the nucleic acid encodes a polypeptide having a laccase activity.

Claim 4 (previously presented): The isolated, synthetic or recombinant nucleic acid of claim 1, wherein the percentage sequence identity is over a region of at least 1700 bases.

Claim 5 (Currently amended): ~~The~~ An isolated, synthetic, or recombinant nucleic acid ~~of claim 1, wherein the nucleic acid sequence comprises~~ comprising the sequence of SEQ ID NO:23.

Claim 6 (Currently amended): The isolated, synthetic, or recombinant nucleic acid of ~~claim 1~~any of the preceding claims 1 through 5, wherein the nucleic acid comprises a sequence that encodes at least 550 contiguous amino acids of a polypeptide comprising the amino acid sequence of SEQ ID NO:24.

Claims 7 - 9 (canceled)

Claim 10 (Currently amended): The isolated, synthetic or recombinant nucleic acid of claim 1, wherein the laccase activity comprises catalyzing the oxidation of 2,2'-azino-bis(3-ethylbenzthiazoline-6-sulfonic acid) (ABTS).

Claim 11 (previously presented): The isolated, synthetic or recombinant nucleic acid of claim 1, wherein the laccase activity comprises a peroxidase activity.

Claim 12 (canceled)

Claim 13 (previously presented): The isolated, synthetic or recombinant nucleic acid of claim 1, wherein the laccase activity comprises oxidation of valencene.

Claim 14-20 (canceled)

Claim 21 (previously presented): The isolated, synthetic or recombinant nucleic acid of claim 1, wherein the laccase activity comprises oxidation of an aromatic amine.

Claim 22 (Currently amended): The isolated, synthetic or recombinant nucleic acid of claim 1, wherein the polypeptide retains a laccase activity after exposure to a temperature range of 55°C ~~and to~~ to 75°C.

Claim 23 (Currently amended): The isolated, synthetic, or recombinant nucleic acid of claim 1, wherein the polypeptide retains a laccase activity under conditions comprising a temperature

range of 55°C[[.]] to 75 ° C.

Claim 24 - 26 (canceled)

Claim 27 (Currently amended): A nucleic acid probe for identifying a nucleic acid encoding a polypeptide with a laccase activity, ~~wherein the probe comprises~~ comprising at least 60 to 150 consecutive bases of a nucleic acid sequence having at least ~~[[90%]]~~95% sequence identity to a subsequence of SEQ ID NO:23, wherein the probe identifies the nucleic acid by binding or hybridization.

Claims 28 to 30 (canceled)

Claim 31 (Previously presented): An amplification primer pair for amplifying a nucleic acid encoding a polypeptide having a laccase activity, wherein the primer pair is capable of amplifying a nucleic acid comprising the sequence of claim 1 wherein the first member comprises at least the first (the 5') 12 bases of SEQ ID NO:23, and the second member comprises at least the first (the 5') 12 bases of the complementary strand of SEQ ID NO:23.

Claims 32-33(canceled)

Claim 34 (Previously presented): A laccase-encoding nucleic acid generated by amplification of a polynucleotide using an amplification primer pair of claim 31.

Claim 35 (canceled)

Claim 36 (Previously presented): The laccase-encoding nucleic acid of claim 34, wherein the nucleic acid is generated by amplification of a gene library.

Claim 37 (Previously presented): The laccase-encoding nucleic acid of claim 36, wherein the gene library is an environmental library.

Claim 38 (previously presented): An isolated, synthetic or recombinant laccase encoded by the laccase-encoding nucleic acid of claim 1.

Claim 39 (canceled)

Claim 40 (Previously presented): An expression cassette comprising the nucleic acid of claim 1.

Claim 41 (Previously presented): A vector comprising the nucleic acid of claim 1.

Claim 42 (Currently amended): A cloning vehicle comprising the nucleic acid of claim 1;  
~~wherein the cloning vehicle comprises a plasmid.~~

Claims 43 to 44 (canceled)

Claim 45 (Currently amended): An isolated transformed cell comprising the nucleic acid of claim 1.

Claim 46 (canceled)

Claim 47 (Currently amended): The isolated transformed cell of claim 45, wherein the cell is a [[a]] yeast cell.

Claims 48-105 (canceled)

Claim 106 (previously presented): A method for producing a recombinant polypeptide having a laccase activity, comprising the steps of:

- (a) transforming a host cell with a nucleic acid operably linked to a promoter, wherein the nucleic acid comprises the sequence of claim 1; and

(b) expressing the nucleic acid of step (a) under conditions that allow expression of the polypeptide, thereby producing the recombinant polypeptide.

Claims 107-125 (canceled)

Claim 126 (previously presented): A method for isolating or recovering a nucleic acid encoding a polypeptide with a laccase activity from an environmental sample, comprising the steps of:

- (a) providing the amplification primer pair of claim 31;
- (b) isolating a nucleic acid from the environmental sample or treating the environmental sample so that nucleic acid in the sample is accessible for hybridization to the amplification primer pair; and
- (c) combining the nucleic acid of step (b) with the amplification primer pair of step (a) and amplifying nucleic acid from the environmental sample, thereby isolating or recovering a nucleic acid encoding a polypeptide with a laccase activity from an environmental sample.

Claim 127 (canceled)

Claim 128 (previously presented): A method for isolating or recovering a nucleic acid encoding a polypeptide with a laccase activity from an environmental samples comprising the steps of:

- (a) providing the probe of claim 27;
- (b) isolating a nucleic acid from the environmental sample or treating the environmental sample so that the nucleic acid is accessible for hybridization to the probe;
- (c) combining the isolated nucleic acid or the treated environmental sample of step (b) with the probe; and
- (d) isolating a nucleic acid that specifically hybridizes with the probe; thereby isolating or recovering a nucleic acid encoding a polypeptide with a laccase activity from an environmental sample.

Claims 129-150 (canceled)

Claim 151 (previously presented): A method for oxidizing an aromatic amine, comprising the following steps:

- (a) providing a polypeptide encoded by the nucleic acid of claim 1;
- (b) providing an aromatic amine; and
- (c) reacting the polypeptide of step (a) with the aromatic amine of step (b) under conditions that facilitate the laccase activity of the polypeptide; thereby modifying oxidizing the aromatic amine a small molecule by a laccase enzymatic reaction.

Claims 152-166 (canceled)

Claim 167 (previously presented): The method of claim 106, wherein step (b) comprises glycosylating the polypeptide.

Claims 168-196 (canceled)

Claim 197 (previously presented): The isolated, synthetic or recombinant nucleic acid of claim 267, further comprising a sequence encoding a signal sequence.

Claims 198-258 (canceled)

Claim 259 (Previously presented): The method of claim 106, wherein the host cell is a yeast cell.

Claim 260 (Previously presented): The method of claim 259, wherein the host is selected from the group consisting of a Schizosaccharomyces sp., Saccharomyces sp., and Pichia sp.

Claim 261 (Previously presented): The method of claim 260, wherein the host is *Schizosaccharomyces pombe*.

Claim 262 (Previously presented): The method of claim 260, wherein the host is *Saccharomyces cerevisiae*.

Claim 263 (Previously presented): The method of claim 260, wherein the host is *Pichia pastoris*.

Claim 264 (Previously presented): The method of claim 106, wherein the host cell is *E. coli*.

Claim 265 (Previously presented): The method of claim 106, wherein the host cell is *Bacillus cereus*.

Claim 266 (previously presented): The nucleic acid of claim 6, wherein the nucleic acid comprises a sequence encoding the polypeptide sequence of SEQ ID NO:24.

Claim 267 (Currently amended): An isolated, synthetic, or recombinant nucleic acid comprising a sequence having at least ~~[[90%]]~~95% identity to at least 1700 bases, over the region of nucleotide ~~residues residue~~ 60 to 1767 of SEQ ID NO:23, wherein the nucleic acid encodes a polypeptide having a laccase activity.

Claim 268 (Currently amended): The nucleic acid of claim 267, wherein the sequence identity is at least ~~[[95%]]~~ 97% to the region of nucleotide ~~residues residue~~ 60 to 1767 of SEQ ID NO:23.

Claim 269 (Currently amended): The nucleic acid of claim 267, wherein the sequence identity is 100% ~~for~~ over at least 1700 consecutive nucleotide residues of SEQ ID NO:23.

Claim 270 (previously presented): The method of claim 151, wherein the aromatic amine is 2,2'-azino-bis(3-ethylbenzthiazoline-6-sulfonic acid) (ABTS).

Claim 271 (previously presented): A method for oxidizing valencene, comprising the following steps:

- (a) providing a polypeptide encoded by the nucleic acid of claim 1;
- (b) providing valencene; and
- (c) reacting the polypeptide of step (a) with the valencene under conditions that facilitate the laccase activity of the polypeptide; thereby oxidizing the valencene.

Claim 272 (canceled)